Increasing Mathematical Achievement Using a Walk to Mathematics Program created by Fourth Grade Teachers

A Special Project

Presented to

Dr. Audrian Huff

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Glenna R. Eilers

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FACULTY APPROVAL

Increasing Mathematical Achievement Using a Walk to Mathematics

Program created by Fourth Grade Teachers

Approved for the Faculty

_____, Faculty Advisor

_____, Date

ABSTRACT

The purpose of the project was to help improve mathematical achievement of fourth grade students using a walk to math program. The program was designed by fourth grade teachers to improve student achievement. The results of the testing helped the fourth grade teachers determine if the walk to math program resulted in increased student achievement.

The author started by evaluating data from the Washington Assessment of Student Learning from fourth grade students previous scores and the Measures of Academic Progress fall test of the current school year to create groups for the walk to math program. The majority of students in the walk to math program used Everyday Mathematics as the base for instruction. Four out of the five fourth grade classrooms used the Everyday Mathematics texts book. The lowest group used the Connecting Mathematics text book.

The author provided the reader with information on how well the Everyday Mathematics program along with the walk to math program worked for the school. This type of walk to math program using the Everyday Mathematics program did work for this strategic classroom and made greater than expected growth, and should be used again.

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t-test of Pre – Post Test Results for fall to winter results on walk to math students.

Test	N	Mean	Standard deviation
Pre	18	193.28	9.44
Post	18	199.00	8.98

df = 17	*t* = 4.31	P< .05

Table 2

t-test of Pre – Post Test Results for fall to spring results on walk to math students.

Test	N	Mean	Standard deviation
Pre	18	6.99	8.98
Post	18	205.50	7.64

df = 17	t = 3.98	P< .05

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Figure 1

2007 – 2008 Fall to Winter MAP scores, 4th

Student	Fall Math	Winter Math
1	207	207
2	214	220
3	197	207
4	195	199
5	196	208
6	192	200
7	197	202
8	194	196
9	187	197
10	185	188
11	176	183
12	205	204
13	200	201
14	185	186
15	190	193
16	189	194
17	181	204
18	189	193

Figure 2

2007 – 2008 MAP scores, 4th

Student	Fall Math	Spring Math
1	207	215
2	214	220
3	197	208
4	195	209
5	196	220
6	192	199
7	197	199
8	194	196
9	187	203
10	185	202
11	176	203
12	205	216
13	200	203
14	185	205
15	190	202
16	189	199
17	181	204
18	189	196

CHAPTER 1

Introduction

Background for the Project

Culturally and linguistically diverse populations had always been represented in the United States. In the years between 1979 and 2006, the number of school-age children that spoke a language other than English at home increased from nine to twenty percent. Statistical information published by the National Center for Education Statistics reflected the increased trend in diversity in America's schools was on the rise, and so teachers needed to examine programs that would help the struggling schools and students to increase student achievement. (National Center for Education Statistics, 2008).

The No Child Left Behind federal legislation of 2001 fundamentally changed the way states and districts approached the education of struggling students. In part, more attempts were made to close the apparent achievement gap between non- English speaking students and English speaking students in the United States. The No Child Left Behind main goal was to put students first. As stated by U.S. Secretary of Education Margaret Spellings, "As our nation grows more diverse, we depend on our schools to ensure that future generations have the knowledge and skills to succeed" and "Its purpose is to improve student achievement by setting a goal of a full grade-level proficiency in reading and mathematics by 2014" (U.S. Department of Education 2001, pg 1).

Statement of the Problem

The elementary school in the rural farming community was faced with not making adequate yearly progress. The elementary school then examined data and resources used in the school in order to improve test scores for the lower achieving students in mathematics and to close the achievement gap. Fourth grade teachers came together to discuss strategies for implementing a program that would help improve student achievement. Using the Everyday Mathematics program implemented in the school district in 2001 and a three minute, thirty second basic facts timed test, as part of a 90-minute mathematics program was developed in order to increase student achievement. The fourth grade teachers also provided students with an after school mathematics program. The after school mathematics program was designed to increase student achievement. The placement of students in the walk to math program was based on the Washington Assessment of Student Learning test students took in the third grade. Students close to passing, but not quite, were the students placed in the after school mathematics program in order to push each student up to the passing level.

Purpose of the Project

The purpose of the project was to help improve mathematical achievement of fourth grade students using a walk to math program. The program was designed by fourth grade teachers to improve student achievement. Everyday Mathematics was the program used to help improve student achievement. At the start of the school year, students were given the fall Measures of Academic Progress test to assess the entry level of each student. The Measures of

Academic Progress test was then given in winter and again in the spring. The results of the testing helped the fourth grade teachers determine if the walk to math program resulted in increased student achievement.

Delimitations

Fourth grade students in the study were comprised of nine and ten year old students. The students lived in a small rural farming and agricultural community in Washington State. The elementary school consisted of 717 students. The majority student population in the elementary school was of Hispanic ethnicity (81.5%). The remaining population of students was White (18.0%), Asian (0.3%), and Black (0.1%). The percentage of students in the school eligible for free and reduced meals was 84.0%. Over half the population was involved in transitional bilingual classes (55.7%) and 25.1% had qualified for migrant status as documented on statistics included in the Washington State Report Card (Office of Superintendent of Public Instruction, 2008). The school was made up of forty-one classroom teachers. The fourth grade team consisted of five highly qualified teachers.

The walk to math classroom used in the study consisted of eighteen students from various skill levels, all but five students were from the author's homeroom class. The students were chosen from the 2007 Washington Assessment of Student Learning individual scores the previous year. The fourth grade teachers then came together to divide the students up according to the Washington Assessment of Learning scores. The authors' classroom consisted of ten girls and eight boys. The classroom had five students that were hard to keep on task throughout the ninety- minute block. One student liked to talk which in turn made the entire class stop and focus

attention on that student. Two boys hardly did any work in the mathematics class. The teacher spent several minutes of the day redirecting the class back to the mathematics lesson.

Assumptions

The researcher assumed fidelity in the Everyday Mathematics curriculum taught in the classroom by the teacher as outlined by the Everyday Mathematics book. Designated materials for the program were used as directed by the highly qualified teacher. The mathematics curriculum was being taught to the full potential as outlined in the materials.

Hypothesis or Research Question

Fourth grade students of a homogeneous group participating in the walk to math program will make greater than expected progress by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and winter Measures of Academic Progress assessment using a statistical *t*-test.

Fourth grade students of a homogeneous group participating in the walk to math program will make greater than expected progress by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and spring Measures of Academic Progress assessment using a statistical *t*-test.

Null Hypothesis

Fourth grade students of a homogeneous group participating in the walk to math program will not make greater than expected progress a by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and winter Measures of Academic Progress assessment, as measured using a statistical *t*-test at a .05 level of significance.

Fourth grade students of a homogeneous group participating in the walk to math program will not make greater than expected progress a by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and spring Measures of Academic Progress assessment, as measured using a statistical *t*-test at a .05 level of significance.

Significance of the Project

After careful review of the school's low mathematical scores on the Washington Assessment of Student Learning from the Office of the Superintendent of Public Instruction, fourth grade teachers came together to create a walk to math program. The author provided information on the school's achievement and how the walk to math program worked. The authors' classroom was in the walk to math program and was one of the middle groups. The project was designed to show if a walk to math program could be successful if done with fidelity. If the students were not achieving success with this program, then the walk to math program was not the answer to improving the school's low mathematics scores.

Procedure

The author started by evaluating data from the Washington Assessment of Student Learning from fourth grade students previous scores and the Measures of Academic Progress fall test of the current school year to create groups for the walk to math program. The majority of students in the walk to math program used Everyday Mathematics as the base for instruction. Four out of the five fourth grade classrooms used the Everyday Mathematics texts book. The lowest group used the Connecting Mathematics text book.

The fourth grade teachers came together to create the groups based on test scores. There were three groups, one high ,one low and then a middle group. The high group had students that passed the Washington Assessment of Student Learning from third grade, the same students also scored high on the Measures of Academic Progress fall test. The low group was based on students that received very low scores on the Washington Assessment of Student Learning, and low scores on the fall Measures of Academic Progress Assessment. Three classrooms taught the middle group. The middle group of students all scored about the same on the Washington Assessment of Student Learning and the fall Measures of Academic Progress Assessment. The author taught one of the middle groups and sent students to the higher and lower groups also.

The mathematics block was 90 minutes of teacher instructed and driven lessons. The daily procedure consisted of a 3.5-minute basic fact timed test followed by the daily mathematics lesson taught by a highly qualified teacher. Students traded mathematics journals with another classmate in order to correct the lesson of the day before. After corrections were completed books were returned to the rightful owners. The teacher then reviewed the errors before starting the new lesson. At the end of each unit an assessment test was given and, depending on students' scores, students were popped or dropped, moved to a higher group, moved to a lower group or stayed in the same group. Teachers met twice a month and analyzed test scores for the movement of students.

Definition of Terms

Adequate Yearly Progress. Each school and district was given a set of data, or scores, based on student achievement after students had taken the Washington Assessment of Student Learning, schools that did not have a high percent of students passing then entered school improvement. AYP meant that school had to improve scores from the previous year by 10%.

Everyday Math. Everyday Mathematics was a comprehensive pre-kindergarten through sixth-grade mathematics curriculum. Everyday Mathematics was a spiral mathematics program designed to increase student achievement.

Measures of Academic Progress. Measures of Academic Progress was a computerized test given to students during the academic school year as a pre-test and posttest measuring students' progress in mathematics.

walk to math. Walk to math was a way to ability group students for mathematics. Students walked to classrooms where mathematics was taught for students at similar ability and skill levels.

Walk to Read. Walk to Read was a way to ability group students for reading. Students were then placed in classrooms with other students with the same ability and skill level.

Washington Assessment of Student Learning. The Washington Assessment of Student Learning was a state test given to third, fourth, fifth, sixth, seventh, eighth and tenth grade students. The Washington Assessment of Student Learning test was used to measure schools' progress and students' achievement.

Acronyms

AYP. Adequate Yearly Progress.

ELL. English Language Learner

MAP. Measure of Academic Progress.

NCLB. No Child Left Behind Act.

OSPI. Office of the Superintendent of Public Instruction.

WASL. Washington Assessment of Student Learning.

NCTM. National Council for Teaching Mathematics

NWEA. Northwest Educational Assessment

CHAPTER 2

Review of Selected Literature

Introduction

The NCLB put more focus on greater expectations on results for students and classroom teachers. The expectations were much higher for all students. Now educators were being held accountable for student achievement and greater results through various mathematics programs. Schools had to demonstrate no, schools were making AYP with the goal in mind that all students would achieve success. In the global economy, all students were expected to learn more mathematics with a deeper understanding (Everyday Mathematics. Scientific Research Evidence of Effectiveness. A Comprehensive Summary, 2007).

The research literature reviewed by the author concerned essential components for enhancement of the mathematics program. The author provided research information on Everyday Mathematics to the reader. The Everyday Mathematics program was a K-12 spiral program built on skills students had already been taught. For all students to learn significant mathematics, content was taught and assessed in meaningful situations.

Everyday Mathematics.

Everyday Mathematics background was developed by the University Of Chicago School Of Mathematics Project based on research about how students learned and developed mathematical skills. Everyday Mathematics provided a balanced approach to learning mathematics with computational skills and conceptual understanding. The reasoning was developed through meaningful activities that emphasized problem solving and real-life

applications. Everyday Mathematics was based on the same research that led to the NCTM standards then along with mathematics educators new standards on how to best teach mathematics to children. Through the standards Everyday Mathematical came to be one of the programs OSPI suggested as being one of the programs approved for schools. Students using the Everyday Mathematics program became more mathematically literate on a wide variety of measures. As stated in Everyday Mathematics Student Achievement Studies , "Everyday Mathematics works. It's working for over 2.8 million elementary school students throughout the United States- in urban, suburban and rural areas- across all socioeconomic lines" (Student Achievement Studies, pg IV).

Everyday Mathematics was based on research. As stated in Everyday Mathematics Scientific Research Evidence of Effectiveness "The research evidence about *Everyday Mathematics* almost all points in the same direction: Children who use Everyday Mathematics tend to learn more mathematics and like it better than children who use other programs" (Scientific Research Evidence of Effectiveness 2007, pg 1). The Everyday Mathematics research used a wide range of instruments and methodologies to measure students' progress and understanding.

Pre and post tests were used as a method which included a variety of effective research designs which included pre-post comparisons, quasi-experimental studies, and longitudinal studies along with observational studies as well. The Everyday Mathematics studies ranged from intensive observations in a small number of classrooms to large-scale studies of numerous children. All of the Everyday Mathematics studies began in the late 1980s and have continued. When students came to fact knowledge and paper- and – pencil computation, students performed very well using the Everyday Mathematics program. Students used a greater variety of

computation solutions and were better on mental computation as shown by the pre-post comparisons. Research showed that students performed as well as or better than students in more traditional basal programs. When students came to having a better understanding for geometry, data, measurement, and algebra, students that used Everyday Mathematics scored higher than the students in more traditional mathememmatics programs. Everyday Mathematics students generally did better on questions that assessed problem solving, reasoning and communication. Students using the Everyday Mathematics curriculum showed improvements across racial, ethnic and low-income level categories. (Scientific Research Evidence of Effectiveness 2007, pg 1). The writer stated “The US Department of Education’s What Works Clearinghouse found Everyday Mathematics to have potentially positive effects on math achievement” (Scientific Research Evidence of Effectiveness 2007, pg 15).

Everyday Mathematics was a comprehensive pre-kindergarten through sixth-grade mathematics curriculum. The curriculum embraced many of the traditional goals’ of school mathematics as well as another goal. The first goal was to substantially raise expectations regarding the amount and range of mathematics students should learn. Another goal was to support teachers and students with materials necessary for students to meet higher expectations (Scientific Research Evidence of Effectiveness 2007, pg 15).

Everyday Mathematics philosophy was created to support students need for a mathematics curriculum that was rigorous and balanced. The curriculum provided emphasis on conceptual understanding while building mastery of basic skills. The curriculum also explored a broad-spectrum of mathematical approaches, not just basic arithmetic. In Everyday Mathematics teachers expected to see a problem solving approach based on everyday situations and an instructional approach that revisited concepts regularly. Frequent practice of basic skills, often

through games, was an essential component to the program that emphasized the skill previously learned. Lessons based on activities and discussion helped to enrich the program. Everyday Mathematics content went beyond basic arithmetic. students developed a broad background by learning concepts and skills in six content strands in fourth grade (Everyday Mathematics, The University of Chicago School Mathematics Project, 2007).

An effective mathematics program balanced three important components of mathematics-

1. conceptual understanding (making sense of mathematics)
2. procedural, proficiency (skills, facts, and procedures),
3. problem solving and mathematical processes (using mathematics to reason and think).

The mathematical broad-based foundation prepared students for any avenue which students choose to pursue in the rapidly changing global environment of the future (Everyday Mathematics, The University of Chicago School Mathematics Project, 2007).

In fourth grade students became proficient with multiplication and division of whole numbers, while developing an understanding of fractions and decimals. In measurement, students developed an understanding for area. The concepts of probability as chance was developed and continued to be expanded through the understanding of statistics using graphing and measurement. Students refined estimation skills for computations and measurement and developed a better understanding of the relations between and among two-dimensional figures. Students recognized geometric reflections and translations. Students were able to draw conclusions and support the conclusions in familiar situations (Everyday Mathematics, The University of Chicago School Mathematics Project, 2007).

English Language Learners and Parent Involvement

Parents were an intricate part in students' education. Unfortunately, many assumptions and language barriers by parents and educators prevented communication, due to the fact that teachers spook English and most parents' only spook Spanish. With the new accountability portion NCLB, issues must be addressed and looked into to find ways for raising at-risk population in order to increase student achievement. The most challenging aspect was how to help ELL students. With the ELL students being the fastest growing population, not only did these mean educators needed to employ best practices and research-based strategies, but needed to embrace local resources that existed. The most reliable available and influential resource was parents. When students were pushed to succeed and learn another language that created anxiety for both the students and parents.

Parents could not only help address the basic needs, but parents needed to learn how to help address the language problems as well. Yet the problem that arose was how the language barrier could be accomplished when the teachers could not speak the language? Freeman and Freeman encouraged teachers who "Don't read and write all the language of their students, to find others who will work with them, including bilingual aides, parents and other bilingual students" (Freeman, David & Freeman, Yvonne, (2002).

Parental Education must first be established to make parents feel welcome in the classroom. Once teachers made contact with parents and established a culturally positive environment, the next step was to educate parents on the ways of the school system and the programs utilized. Most parents were not fully aware of the schools and district policies concerning bilingual education. To address the culturally issue, schools must implement a

bilingual education program. The bilingual education program would help the parents. The program should be done ever year in which the program was outlined for the parents. The material should be distributed in Spanish that described the benefits of bilingual education for children as well as information. This bilingual education program would not take much time and the results of educating parents should be the number one resource (Sheffer, Cherie, (2004) pg 20).

Walk to Read

Walk to read was a method designed for teaching reading. Students were first assessed and then placed in groups based on the scores that correlated with the content being based on the individual needed of each student. Walk to read programs were designed to challenge each individual student at an individual instructional level to increase student achievement the individual groups were designed to help increase student achievement. (Tracking and Ability Grouping, 2007). The end result was a division of students into categories that reflected a high, medium and low group of students. From the groupings, students were then sent to different rooms this is where the terminology walk to read came in to effect. Walk to read programs were designed to challenge each student at individual instructional level as opposed to a frustration level (Tracking and Ability Grouping, 2007).

Ability Grouping

The research on ability grouping was ultimately undecided. For every study that supported ability, grouping there was another study that talked about if ability grouping was effective or not. Negative characteristics of ability grouping have been that tracking can lead to

students being labeled both in their minds and in the minds of others. When the truth was that students were placed in individual groups based on the ability of each student. As stated by Anne Weelock, “That tracking is harmful to students for a number of reasons: The criteria we use to group kids are based on subjective perceptions and fairly narrow views of intelligence. Tracking leads students to take on labels- both in their own minds as well as in the minds of their teachers- that are usually associated with the pace of learning (such as the slow or fast learners). Because of this we end up confusing students’ pace of learning with their capacity to learn” (Muir, 2007 pg 10). Ability grouped students generally stayed at the same level for the entire school careers and the gap in student achievement levels became exaggerated over time (Muir, 2007 pg 12).

Research on different types of ability grouping in elementary schools was found to increase student achievement if done a particular way. Students that were grouped heterogeneously for most of the school day, but then regrouped according to abilities for one or more subjects could improve student achievement. Grouping heterogeneously except for reading improved reading achievement. No graded instruction that grouped students according to abilities rather that age and allowed students to progress at individual rates would improve achievement. In-class grouping, which was a common approach where teachers broke students into individual groups within the classroom setting, showed student achievement (Muir, 2007 pg 15).

Ability grouping has been shown to be effective in all grade levels when done in a particular way shown to improve student achievement. Grouping students by abilities for one or two content areas’ and modified instruction to match students abilities was found to be the most effective way for ability grouping to work (Muir, 2007 pg 16).

Walk to Math.

Walk to math was a program fourth grade teachers designed to try to help students' become more successful in mathematics. Walk to math was a method designed for teaching mathematics by ability grouping students. Students were first assessed and then placed in groups based on the scores. The individual groups were designed to help increase student achievement. Walk to math programs were designed to challenge each individual student at an individual instructional level to increase student achievement. There was no research to be found on the walk to math program.

School Improvement.

Being identified as a school in need of interventions allowed the school to access assistance in identifying and addressing instructional issues that prevented students who attended that school from attaining proficiency in the core academic subjects of reading and mathematics. The school improvement process and timeline was designed to create a sense of urgency about reform and to focus identified schools on quickly and efficiently improving student outcomes.

The purpose of the school improvement plan was to improve the quality of teaching and learning in the school. School improvement meant that greater numbers of students would achieve proficiency in the core academic subjects of reading and mathematics to show student improvement in. The school improvement plan provided a framework for analyzing problems, identifying underlying causes, and addressing instructional issues in the school that did not made sufficient progress in student achievement. The process of school improvement began with

school developing a required two-year plan that addressed the academic issues that caused the school to be identified for school improvement. The school developed a new plan or revised an existing one, but in either case must be completed no later than three months after the school was identified for school improvement. A school identified for improvement would need to make AYP as defined in the State accountability system for two consecutive school years in order to exit school improvement. If schools did not make AYP for two consecutive years, the school then would undergo one year of school improvement (Office of Superintendent of Public Instruction, 2008).

Assessment.

Assessment was a process of reasoning from evidence. Assessment was aligned with the goals of curriculum and instruction. Whatever conclusions teachers made about students' thinking was based on observation or products students produced. The purpose of assessments severed three main functions to support learning, measure achievement and evaluate programs. Formative assessment supported learning by providing information about students' current knowledge and abilities for creating better for future instruction by teachers. Formative assessment encouraged students to identify areas of weakness or strength Summative assessment measured students' growth and achievement, which was designed to determine whether students had learned certain materials by the end of a unit. Program evaluation judged how well a program worked.

Contexts for assessment occurred in three major ways. One way was ongoing assessment which was information gathered from students' everyday work. The assessments could take place at the same time as instruction. Another form of assessment was periodic assessment,

which was done through formal assessments built into a curriculum, such as the end of unit tests. The last assessment was external assessments which were independent of the school curriculum (Office of Superintendent of Public Instruction, 2008).

Essential Academic Learning Requirements

The mathematics standards were built on Washington's commitment to teaching mathematics content and mathematical thinking. The former Essential Academic Learning Requirements and Grade Level Expectations provided the foundation upon which to build new, challenging, accessible standards at each grade level within a well-balanced mathematics program. The former mathematics EALRs represented the development of mathematical content, reasoning, problem solving, and communication intended to be reflected in the new state standards (Office of Superintendent of Public Instruction, 2008).

Washington Assessment of Student Learning.

The Education Reform Law passed by the Washington State Legislature in 1993 required the state to create common learning standards for grades K-10. The law also called for a testing system that measured student learning of all standards. The WASL was at the heart of the state assessment system but not the only way teachers' measured student learning in Washington. The WASL was used to meet state and federal testing requirements (Office of Superintendent of Public Instruction, 2008).

The Washington Assessment of Student Learning measured student learning of skills and knowledge important to children's success in school and life. Educators used WASL results to improve teaching and do a better job of meeting student's academic needs. The WASL was a

mix of multiple-choice, short-answer and extended-response questions. The WASL also had no testing time limits, so students could take the time needed to finish, the tests must be done by the end of the school day, or the student does not receive credit.

The WASL had several performance levels that the state went by to rate students' achievement. Performance levels gave teachers, parents/guardians and students more information about a student's strengths and areas for improvement after taking the Washington Assessment of Student Learning the benchmark for each is between 374 and 400. Performance levels were broken down by grade and by the score levels, students could earn basic (Level 2), Proficient (Level 3) and Advanced (Level 4). There were no descriptors for Below Basic (Level 1) (Office of Superintendent of Public Instruction, 2008). In reading, a score of 274-374 was level1, a score of 375-399 was level two, and a score of 400-425 was level 3. In addition, scores of 426-500 was level 4. In Mathematics a score of 175-374 was level 1, a score of 375-399 was level 2, a score of 400-439 was level 3, and 440-550 was level 4. In writing the scoring was done a little differently. A score of 0-6 was level 1, a score of 7-8 was level 2, a score of 9-10 was level 3, and a score of 11-12 was level 4.

The lowest scale scored was assigned to a booklet that earned zero points when the minimum response criteria was not met. The highest scale score was assigned to a booklet that earned a perfect score. The tests were given in reading, mathematics, science and writing was based on the response given by students (Office of Superintendent of Public Instruction, 2008).

Measures of Academic Progress.

Measures of Academic Progress were state-aligned computerized adaptive tests that accurately reflected the instructional level of students and measured growth over time. The MAP

assessments were tests t teachers used to adapt students'curriculum according to the way students' scored on mathematics and reading assessments. The MAP tests measured what a child knew and needed to learn. In addition, MAP tests measured academic growth over time independent of grade level or age. Measures of Academic Progress test results provided educators with timely information that guided instructional planning and school improvement.

Measures of Academic Progress tests provided highly accurate results that were then used to identify the skills and concepts individual students had learned. The tests were also able to help teachers to diagnose instructional needs for individual students. Measures of Academic Progress tests were designed to monitor academic growth over time. Measures of Academic Progress tests also helped make data-driven decisions at the classroom, school, and district levels which were helpful in order to improve students' academic successes. Measures of Academic Progress tests were needed to place new students into appropriate instructional programs within the school. The test were given three times a year. The tests were given in reading and mathematics and were given in the fall, winter and spring (Office of Superintendent of Public Instruction, 2008).

Summary

The author provided the reader with information on how well the Everyday Mathematics program along with the walk to math program worked for the school. The author also talked about several programs that were used in the school and, how the programs were used. With all of the programs in place and used correctly would the walk to math actually make a difference in student achievement, and improve the schools scores. Is this the type of intervention the would

actually work or not, to help increase student achievement? Did the test scores actually improve? How well did this type of program work, and will it be used again.

Chapter 3

Methodology and Treatment of Data

Introduction

The project studied consisted of a ten-month implementation of mathematics intervention. The author considered several factors when the program was developed. The schools mathematics scores were not meeting state standard benchmarks. The results of the studied documented pre and post assessments scores as measured by the MAP test. The study was a quantitative design with pre and post results as assessments used to compare the amount of student growth in the area of mathematics.

Methodology

The researcher used an quasi-experimental walk to math program. Students in the public school fourth grade class were instructed in explicit, intense mathematics instructions. The purpose of the program was to measure growth that occurred from fall to winter and fall to spring in mathematics. The study relied on quantitive results from the pre and post assessments of the MAP test.

Participants

The classroom used in the study consisted of eighteen students from various skill levels. The students were chosen using scores from the 2007 Washington Assessment of Student Learning. The fourth grade teacher then came together to divide the students up according to the

Washington Assessment of Learning scores. The researcher's walk to math classroom consisted of ten girls and eight boys; all but one boy was Hispanic. In this classroom only five were from the homeroom and all the others were from different classrooms. The same eighteen students stated in this group from start to finish. The classroom had five students that were hard to keep on task throughout the ninety- minute block. One student liked to talk which in turn made the entire class stop and focus attention on that student. Two boys hardly did any work in the mathematics class. The teacher spent several minutes of the day redirecting the class back to the mathematics lesson each day.

Instruments

Data collected for the study was taken from the data from fall, winter and spring MAP tests. The statistical tests were computed using Stat Pak. The Everyday Mathematics program was used, and targeted to the instructional level of the lower achieving students.

Design

The grouping of students was based on the mathematical ability of each student. The MAP in the fall, winter and spring were the tests used for the grouping of the strategic students. The mathematics program was done with consistent and regularly assessed student progress. The fall MAP was the pre-test for fall to winter comparison as well as fall to spring comparison using *t*-tests for non-independent groups.

Procedure

The author started by evaluating data from the Washington Assessment of Student Learning from fourth grade students previous scores and the Measures of Academic Progress fall test of the current school year to create groups for the walk to math program. The majority of students in the walk to math program used Everyday Mathematics as the base for instruction. Four out of the 5 fourth grade classrooms used the Everyday Mathematics texts book. The lowest group used the Connecting Mathematics text book.

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stayed in the same group. Teachers met twice a month and analyzed test scores for the movement of students.

Treatment of Data

With the scores from the fall MAP test the fourth grade teachers came together to decide if any students participating in the walk to math program needed to be moved up or down. From the scores the teachers were able to see if the original placement of students was correct. After all three of the MAP tests were done the author ran a non- independent *t*- test to find significance or not between the fall and spring and the fall to winter tests for the writers' classroom

Summary

The authors' fourth grade walk to math classroom was considered a strategic group. The fourth grade classroom used the Everyday Mathematics program as a base of instruction. Measures of Academic Progress tests were given fall, winter and spring in order to compare students' growth at the middle and at the end of the school year.

CHAPTER 4

Analysis of the Data

Introduction

The elementary school in the rural farming community was faced with not making adequate yearly progress. The elementary school then examined data and resources used in the school in order to improve test scores for the lower achieving students in mathematics and to close the achievement gap. Fourth grade teachers came together to discuss strategies for implementing a program that would help improve student achievement.

Description of the Environment

Fourth grade students in the study were comprised of nine and ten year old students. The students lived in a small rural farming and agricultural community in Washington State. The elementary school consisted of 717 students. The majority student population in the elementary school was of Hispanic ethnicity (81.5%). The remaining population of students was White (18.0%), Asian (0.3%), and Black (0.1%). The percentage of students in the school eligible for free or reduced meals was 84.0%. Over half the population was involved in transitional bilingual classes (55.7%) and 25.1% had qualified for migrant status as documented on statistics included in the Washington State Report Card (Office of the Superintendent of Public Instruction, 2008).

The school was made up of forty-one classroom teachers. The fourth grade team consisted of five highly qualified teachers.

The classroom used in the study consisted of eighteen students from various skill levels; all but five students were from the author's homeroom class. The students were chosen based on the student's 2007 Washington Assessment of Student Learning individual scores.. The author's classroom consisted of ten girls and eight boys. The walk to math classroom had five students that were hard to keep on task throughout the ninety- minute block. One student liked to talk which in turn made the entire class stop and focus attention on that student. Two boys hardly did any work in the mathematics class. The teacher spent several minutes of the day redirecting the class back to the mathematics lesson.

Hypothesis or Research Question

Fourth grade students of a homogeneous group participating in the walk to math program will make greater than expected progress by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and winter Measures of Academic Progress assessment using a statistical *t*-test.

Fourth grade students of a homogeneous group participating in the walk to math program will make greater than expected progress by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and spring Measures of Academic Progress assessment using a statistical *t*-test.

Null Hypothesis

Fourth grade students of a homogeneous group participating in the walk to math program will not make greater than expected progress a by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and winter Measures of Academic Progress assessment, as measured using a statistical *t*-test at a .05 level of significance.

Fourth grade students of a homogeneous group participating in the walk to math program will not make greater than expected progress a by using Everyday Mathematics along with a walk to math program as measured by a pre and post mathematics fall and spring Measures of Academic Progress assessment, as measured using a statistical *t*-test at a .05 level of significance.

Results of the Study

Table 1

t-test of Pre – Post Test Results for fall to winter results on walk to math students.

Test	N	Mean	Standard deviation
Pre	18	193.28	9.44
Post	18	199.00	8.98

df = 17	$t = 4.31$	P< .05

The null hypothesis was rejected because the students made greater than expected growth as measured by a *t*-test. Students using walk to math and Everyday Mathematics did make greater than expected progress from fall to winter.

Results of the Study

Table 2

t-test of Pre – Post Test Results for fall to spring results on walk to math students.

Test	N	Mean	Standard deviation
Pre	18	6.99	8.98
Post	18	205.50	7.64

df = 17	t = 3.98	P< .05

The null hypothesis was rejected because the students made greater than expected growth as measured by a *t*-test. Students using walk to math and Everyday Mathematics did make greater than expected progress from fall to spring.

Findings

The findings from the results were that the strategic group made progress from the fall to winter based on the pre/post MAP tests. The strategic mathematics group also made significant progress from winter to spring on the MAP test. The results indicated the walk to math program combined with Everyday Mathematics did work. The walk to math combined with Everyday Mathematics showed promise in increasing students' mathematics achievement with the ability group.

Discussion

After further examination of the walk to math program one should have seen from the results that this was the type of program that needed to be in place for students to be successful in mathematics. The walk to math program had growth between the fall to winter scores. Using the Everyday Mathematics with this strategic group, had a significant growth. The students' mathematics ability grew from the beginning of the school.

Summary

After further examination of the walk to math program with the Everyday Mathematics program it worked and the school must considers do the program again. After seeing all the research and the test scores the walk to math program with Everyday Mathematics would work to increase greater student achievement if monitored and done according to the book. Students in this walk to math strategic classroom made greater than expected growth from using this type of program.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

After doing all the research on the different way to group students and to help students have a greater success rate when doing mathematics using the Everyday Mathematics program was the answer to raising the student achievement in lower performing schools. Researchers say that ability grouping is not the answer to the problem, but if grouping students is what will work in order to have greater student achievement, then grouping is what the school needed to do.

Summary

After doing all of the research on the way the Everyday Mathematics program can be beneficial to all students, the fourth grade teachers needed to re- think the way the grouping of students was done, in order to better serve all students. After seeing all the research and the test scores, the walk to math program with Everyday Mathematics will work better once redesigned

to have greater student achievement. If students can be grouped more closely in scores and have all the same ability level in one classroom, the walk to math program using the Everyday Mathematics will have better success.

The No Child Left Behind federal legislation act of 2001 fundamentally changed the way states and districts approached the education of struggling students. The No Child Left Behind main goal was to put students first. With the school now doing the walk to math program with Everyday Mathematics, the school is now on the right track to changing the school for the better.

Conclusions

The author provided the reader with information on how well the Everyday Mathematics program along with the walk to math program worked for the school. This type of walk to math program using the Everyday Mathematics program did work for this strategic classroom and the students made greater than expected growth, and should be used again. The walk to math program worked for this year with students showing success by using this type of program.

Recommendations

The recommendations are that the fourth grade teachers' continue the walk to math program with Everyday Mathematics. The walk to math program needs a few changes made to improve the outcomes better, but this was the first year the school had the program in place. The reason that the school went to using the walk to math program was to try and improve student achievement. Fourth grade teachers need to reconsider placement for students, and break the groups up even more than the teachers did. By breaking the students down into more groups, the students' could be grouped with more students with the same scores.

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APPENDIX

Figure 1

2007 – 2008 Fall to Winter MAP scores, 4th

Student	Fall Math	Winter Math
1	207	207
2	214	220
3	197	207
4	195	199
5	196	208
6	192	200
7	197	202
8	194	196
9	187	197
10	185	188
11	176	183
12	205	204
13	200	201
14	185	186
15	190	193
16	189	194
17	181	204
18	189	193

Figure 2

2007 – 2008 MAP scores, 4th

Student	Fall Math	Spring Math
1	207	215
2	214	220
3	197	208
4	195	209
5	196	220
6	192	199
7	197	199
8	194	196
9	187	203
10	185	202
11	176	203
12	205	216
13	200	203
14	185	205
15	190	202
16	189	199
17	181	204
18	189	196